FORM PTO-1390 (Modified) (REV 11-2000) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER	
RCA 89656	
U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR	
10/031155	
INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE
PCT/US00/19103	13 July 2000 (13.07.00)
PRIORITY DATE CLAIMED	
16 July 1999 (16.07.99)	

TITLE OF INVENTION

TELEVISION RECEIVER FOR DIGITAL SIGNALS WITH OFFSET TUNING PROVISIONS

APPLICANT(S) FOR DO/EO/US

Matthew Thomas Mayer

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below.
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
   a. ☐ is attached hereto (required only if not communicated by the International Bureau).
   b. ☐ has been communicated by the International Bureau.
   c. ☒ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
   a. ☐ is attached hereto.
   b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
   a. ☐ are attached hereto (required only if not communicated by the International Bureau).
   b. ☐ have been communicated by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☒ A copy of the International Search Report (PCT/ISA/210).

Items 13 to 20 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
20. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
21. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
22. ☒ Certificate of Mailing by Express Mail
23. ☒ Other items or information:

    Return Postcard Receipt

EXPRESS MAIL LABEL NO. EL902321722US **DATE DEPOSITED: January 14, 2002**

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
10/031155	PCT/US00/19103	RCA 89656

24. The following fees are submitted:.

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

		CALCULATIONS PTO USE ONLY
☐	Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO $1040.00	
☒	International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO $890.00	
☐	International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO $740.00	
☐	International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) $710.00	
☐	International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) $100.00	
	ENTER APPROPRIATE BASIC FEE AMOUNT =	$890.00
	Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).	$0.00

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	6 - 20 =	0	x $18.00	$0.00
Independent claims	2 - 3 =	0	x $84.00	$0.00
Multiple Dependent Claims **(check if applicable).**			☐	$0.00

TOTAL OF ABOVE CALCULATIONS =	$890.00
☐ Applicant claims small entity status. See 37 CFR 1.27). The fees indicated above are reduced by 1/2.	$0.00
SUBTOTAL =	$890.00
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)). +	$0.00
TOTAL NATIONAL FEE =	$890.00
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) **(check if applicable).** ☐	$40.00
TOTAL FEES ENCLOSED =	$930.00
Amount to be: refunded	$
charged	$930.00

a. ☐ A check in the amount of _____ to cover the above fees is enclosed.

b. ☒ Please charge my Deposit Account No. **07-0832** in the amount of **$930.00** to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. **07-0832** A duplicate copy of this sheet is enclosed.

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Mr. Joseph S. Tripoli
THOMSON multimedia Licensing Inc.
Patent Department
PO Box 5312
Princeton, New Jersey 08540

SIGNATURE

KUNIYUKI AKIYAMA
NAME

43,314
REGISTRATION NUMBER

January 14, 2002
DATE

EXPRESS MAIL LABEL NO. EL902321722US

RCA 89656

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Matthew Thomas Mayer

Filed : Herewith

For : TELEVISION RECEIVER FOR DIGITAL SIGNALS WITH OFFSET TUNING PROVISIONS

PRELIMINARY AMENDMENT

Hon. Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Sir:

In the US national phase application of PCT/US00/19103 filed herewith, please enter the following amendments:

IN THE SPECIFICATION:

Please amend the specification as follows:

On Page 1, line 3, please insert the following paragraph

--This application claims the benefit under 35 U.S.C. § 365 of International Application PCT/US00/ 19103, filed July 13, 2000, which was published in accordance with PCT Article 21(2) on January 25, 2001 in English; and which claims benefit of U.S. provisional application serial no. 60/144,415 filed July 16, 1999.--

IN THE ABSTRACT:

Please add the following Abstract.

-- A television receiver for receiving digital and analog signals that reduces adjacent channel interference when receiving digital signals susceptible to interference caused by a lower adjacent NTSC signal. Upon receiving the digital signal, the receiver heterodynes the digital signal with a local oscillator signal to produce an intermediate frequency signal. A microprocessor searches a memory unit for stored information regarding the digital broadcast channel and determines the

presence or absence of a lower adjacent NTSC channel. In the case a lower adjacent NTSC channel is present, the microprocessor shifts the frequency of the LO signal causing the IF signal to shift towards the lower band edge of a surface acoustic wave filter present in a digital signal processor further attenuating the lower adjacent NTSC channel.--

REMARKS

The specification has been amended to include a reference to the priority applications.

To meet the requirements of the United States, the Abstract (as originally filed in the PCT application) is added.

No fee is believed to have been incurred by virtue of this amendment. However if a fee is incurred on the basis of this amendment, please charge such fee against deposit account 07-0832

Respectfully submitted,
Matthew Thomas Mayer

Kuniyuki Akiyama
Attorney for Applicant
Registration No. 43,314
609/734-9404

THOMSON multimedia Licensing Inc.
Patent Operation
PO Box 5312
Princeton, NJ 08543-5312

January 14, 2002

TELEVISION RECEIVER FOR DIGITAL SIGNALS WITH OFFSET TUNING PROVISIONS

FIELD OF THE INVENTION

The invention generally relates to a digital television receiver. More particularly, the invention relates to an apparatus for selectively offsetting the frequency of a desired signal to obtain greater attenuation of undesired signals.

BACKGROUND OF THE DISCLOSURE

A Digital Television Standard published by the Advanced Television Subcommittee (ATSC) specifies vestigial sideband (VSB) signals for transmitting digital television (DTV) signals, such as high definition television (HDTV) signals. The VSB signals are transmitted in 6-MHz bandwidth television channels such as those currently used in conventional terrestrial broadcasting of National Television Subcommittee (NTSC) analog television signals within the United States. The HDTV system is incompatible with the NTSC broadcast standard, thus, if the broadcasting industry immediately adopted the digital HDTV system and abandoned the NTSC system, NTSC television receivers purchased within the last few years would be rendered obsolete. To avoid this undesirable result, the transition from conventional analog NTSC-standard broadcasts to digital HDTV television broadcasts will occur over a period that may last fifteen years to allow for normal attrition of older NTSC television receivers. Thus, during this transition period, both NTSC analog and HDTV digital signals will occupy the television spectrum. Television receivers manufactured during the transition period will be capable of processing both NTSC and HDTV signals.

At a particular geographic location, a receiver may receive signals from two transmitters that have adjacent channel spectrum allocations (e.g., an HDTV channel adjacent to an NTSC channel). When attempting to receive one of the signals (the desired signal), the other (the undesired, adjacent channel signal)

creates interference in the system. Consequently, the signals must be filtered to reduce the interference from the adjacent channel signal. This situation is particularly problematic when the desired signal is an HDTV signal and the undesired signal is a lower adjacent NTSC signal because of the proximity of the aural carrier of the NTSC signal to the digital signal. The desired to undesired (D/U) signal ratio can be more than –40 dB. This presents an extreme challenge to fabricate surface acoustic wave (SAW) filters, such as those required by digital television receivers, that have a steep transition band roll off in order to remove the undesired signal without significantly attenuating the desired signal.

Thus, there exists a need in the art for digital television receivers using conventional SAW filters that are able to reduce adjacent channel interference, particularly, lower adjacent NTSC channel interference.

SUMMARY OF THE INVENTION

The invention overcomes the disadvantages associated with the prior art by providing a television receiver for reducing adjacent channel interference when receiving digital signals. Specifically, the invention tunes to a digital signal associated with a selected broadcast channel and downconverts the digital signal to an intermediate frequency (IF) signal. The center frequency of the IF signal is determined by a microprocessor, which searches a memory unit for information associated with a selected broadcast channel and determines the presence or absence of a lower adjacent NTSC analog channel. In the case a lower adjacent NTSC analog channel is present, the microprocessor causes the IF signal to be shifted by 62.5 kHz. The IF signal is thus pushed further towards the band edge of the surface acoustic wave filter present in the digital signal processor, resulting in further attenuation of the lower adjacent NTSC signal, particularly the aural carrier of the NTSC signal.

In an alternative embodiment of the invention, the microprocessor determines the input signal power of the tuned digital signal using data obtained from an automatic gain control (AGC) circuit. If the microprocessor determines the input signal power is larger than that of the adjacent channel, the

microprocessor does not cause the frequency of the IF signal to be shifted from nominal.

BRIEF DESCRIPTION OF THE DRAWINGS

The teachings of the present invention can be readily understood by considering the following detailed description in conjunction with the accompanying drawings, in which:

FIG. 1 depicts a block diagram of a television receiver in accordance with the present invention;

FIG. 2A illustrates an IF spectrum and SAW filter response before frequency shift;

FIG. 2B illustrates an IF spectrum and SAW filter response after frequency shift; and

FIG. 3 illustrates the desired to undesired signal ratio for both nominal frequency and shifted frequency television signals.

To facilitate understanding, identical reference numerals have been used, where possible, to designate identical elements that are common to the figures.

DETAILED DESCRIPTION

FIG. 1 depicts a block diagram of a television receiver 100 in accordance with the present invention. The receiver 100 comprises a tuner 104 coupled to an RF source 102, a frequency conversion stage 106, a demodulation stage 108, a microprocessor 110 coupled to a memory unit 112, and an automatic gain control (AGC) circuit 130. The tuner 104 selects the radio frequency (RF) signal corresponding to a broadcast channel selected from a plurality of channel locations in a frequency band provided by the RF source 102. The RF signals associated with broadcast channels are analog and digital television signals. The analog television signal may comprise a conventional National Television Standard Committee (NTSC) modulated signal within the United States. The digital television signal may comprise a Vestigial Sideband (VSB) modulated

signal in compliance with the Advanced Television Systems Committee (ATSC) standard A/53, for example, a high definition television (HDTV) signal.

The frequency conversion stage 106 comprises a mixer 114, a local oscillator (LO) 116, a phase-locked loop (PLL) 118, an IF filter 120, and an IF amplifier 122. The mixer 114 is coupled to the tuner 104 and receives the RF signal. The LO 116 is also coupled to the mixer 114. The LO 116 generates a LO signal having either a nominal frequency corresponding to the selected broadcast channel or a frequency shifted upward from nominal by 62.5 kHz. The PLL 118 controls the frequency of the LO signal using feedback from the demodulation stage 108 and signals from the microprocessor 110. The PLL 118 causes the LO 116 to generate a nominal frequency when the microprocessor 110 determines the absence of a lower adjacent analog broadcast channel. The PLL 118 causes the LO 116 to generate a frequency shifted upward from nominal by 62.5 kHz when the microprocessor 110 determines the presence of a lower adjacent analog broadcast channel.

The mixer 114 heterodynes the selected RF signal and the LO signal to produce a downconverted IF signal. The mixer 114 produces the sum and difference frequency products of the LO signal and the selected RF signal. The IF signal is coupled to the IF filter 120 that has a passband response selected to pass the difference frequency product of the LO signal and the selected RF signal. As shown in FIG. 2A, the spectrum of the filtered IF signal is a mirror image of the signal spectrum before downconversion. The IF amplifier is coupled to the IF filter and amplifies the IF signal for output to the demodulation stage 108.

When downconverting the selected RF signal, the frequency of the LO signal is determined using the following equation:

$$f_{LO} = f_c + f_{IF}$$

where f_C is the center frequency of the selected RF signal. When the microprocessor 110 determines the presence of a lower adjacent analog broadcast channel, f_{LO} is shifted upward from the nominal level by one 62.5 kHz (the resolution of the PLL 118). Thus, because the filtered IF signal is mirrored, the center frequency of the filtered IF signal, f_{IF}, is also shifted upward by 62.5 kHz.

In the United States, f_{IF} of the video carrier is nominally 45.75 MHz for analog television signals and 44 MHz for digital television signals.

The demodulation stage 108 comprises an analog signal processor 124 and a digital signal processor 126 having a surface acoustic wave (SAW) filter 128. The analog signal processor 124 is coupled to the IF amplifier 122 and demodulates and processes the IF signal for output. The SAW filter 128 of the digital signal processor 126 is coupled to the IF amplifier 122. The SAW filter 128 has a center frequency f_{IF} and has a passband designed to pass the inband digital signal and attenuate adjacent signals associated with both the upper and lower broadcast channels. The digital signal processor 126 is coupled to the SAW filter 128 and demodulates and processes the filtered IF signal for output.

The microprocessor 110 executes software stored in the memory unit 112 to determine if a lower analog signal adjacent the digital signal associated with the selected broadcast channel is present. Specifically, the microprocessor 110 searches the memory unit 112 for information regarding the selected broadcast channel. If the selected broadcast channel is a digital channel, the microprocessor 110 determines the presence or absence of a lower adjacent analog channel. When a lower adjacent analog channel is absent, the microprocessor causes the frequency of the LO signal to be nominal. When a lower adjacent analog channel is present, the microprocessor 110 causes the frequency of the LO signal to be shifted from nominal by 62.5 kHz.

In an alternative embodiment of the invention, the microprocessor 110 receives signals from the AGC circuit 130 regarding the signal power of the selected RF signal. When the signal power is comparable to that of the lower adjacent analog signal, the microprocessor 110 performs the frequency shifting operation. When the signal power is larger than that of the lower adjacent analog signal, the microprocessor 110 does not perform the frequency shifting operation.

FIG. 2 illustrates the operation of the present invention when the selected broadcast channel is associated with an HDTV signal and both upper and lower adjacent broadcast channels are associated with NTSC signals. FIG. 2A shows the spectrum of the downconverted HDTV signal with both upper and lower

adjacent NTSC channels before the frequency shifting operation of the present invention. Because downconversion flips the spectrum of the IF signal, the lower adjacent NTSC signal has a higher center frequency than that of the selected HDTV signal. The dashed line indicates the frequency response of the SAW filter 128 of the digital signal processor 126. As shown, the aural carrier of the lower adjacent NTSC signal is within the passband of the SAW filter, which can cause interference in the demodulation and processing performed by the digital signal processor 126.

FIG. 2B shows the spectrum of the downconverted HDTV signal with both the upper and lower adjacent channels after the frequency shifting operation of the present invention. As shown, f_{IF} is shifted upward from nominal by 62.5 kHz thereby shifting the spectrum of the desired inband HDTV signal towards the upper band of the SAW filter 128. As a result, the aural carrier of the lower adjacent NTSC signal is shifted out of the passband of the SAW filter. FIG. 3 shows the effects of the present invention when receiving an HDTV signal in the presence of a lower adjacent NTSC signal for a plurality of broadcast channels.

Although various embodiments which incorporate the teachings of the present invention have been shown and described in detail herein, those skilled in the art may readily devise many other varied embodiments that still incorporate these teachings.

What is claimed is:

1. A television receiver for receiving a digital television signal susceptible to inference caused by a lower adjacent analog television signal, said television receiver comprising:

a tuner for receiving the digital signal associated with a broadcast channel selected from a plurality of channel locations in a frequency band;

a frequency conversion stage, coupled to said tuner, for converting in frequency the digital signal to an intermediate frequency (IF) signal to be output, where the center frequency of said IF signal is capable of being switched to a nominal frequency or to a second frequency being different than said nominal frequency; and

a filter, coupled to said frequency conversion stage, for attenuating adjacent signals, said filter having a center frequency equal to said nominal frequency;

where said filter, in response to the center frequency of said IF signal being switched to said second frequency, further attenuates a lower adjacent analog signal.

2. The television receiver of claim 1 further comprising:

a memory unit for storing software and information associated with each of the plurality of broadcast channels; and

a microprocessor, coupled to said memory unit and said frequency conversion stage, for executing software stored in said memory unit, searching said memory unit for a lower analog signal adjacent to the digital signal, and causing the center frequency of said IF signal to be switched to either said nominal frequency or said second frequency;

where said microprocessor, in response to the absence of a lower analog signal adjacent to the digital signal, causes the center frequency of said IF signal to be switched to said nominal frequency;

said microprocessor, in response to the presence of a lower analog signal adjacent to the digital signal, causes the center frequency of said IF signal to be switched to said second frequency.

3. The television receiver of claim 1 wherein said frequency conversion stage comprises:

a local oscillator for generating a local oscillation signal;

a phase-locked loop, coupled to said local oscillator, for controlling the frequency of said local oscillation signal;

a mixer, coupled to said local oscillator, for heterodyning the digital signal with said local oscillation signal to generate said IF signal; and

an IF filter, coupled to said mixer, for passing the lower band of said IF signal.

4. The television receiver of claim 1 wherein said second frequency is said nominal frequency shifted upward by 62.5 kHz.

5. A method of receiving a digital television signal susceptible to interference caused by a lower adjacent analog television signal comprising the steps of:

tuning a radio frequency (RF) signal having a digital signal inband and a lower adjacent analog signal;

offsetting the frequency of a local oscillator (LO) signal;

heterodyning said RF signal with said LO signal to generate a modified intermediate frequency (IF) signal having a frequency offset from nominal; and

filtering said modified IF signal to attenuate said lower adjacent analog signal.

6. The method of claim 5 wherein offsetting the frequency of said LO signal comprises shifting the frequency of said LO signal upward by 62.5 kHz.

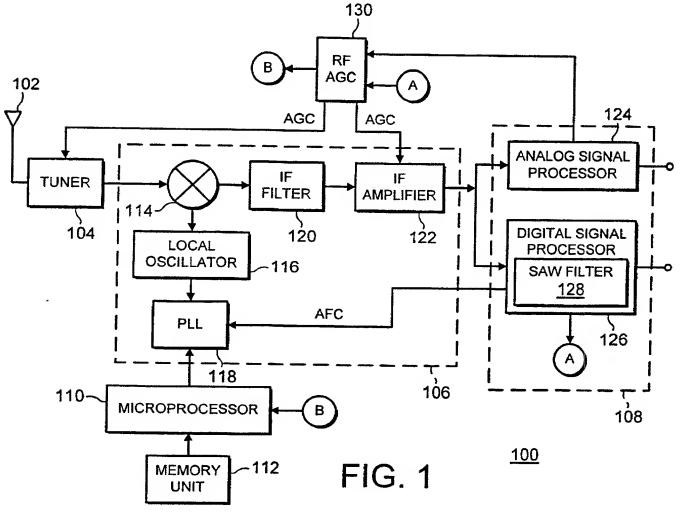
130
RF AGC
B
A
102
AGC
AGC
124
TUNER
104
114
IF FILTER
120
IF AMPLIFIER
122
ANALOG SIGNAL PROCESSOR
DIGITAL SIGNAL PROCESSOR
SAW FILTER 128
126
LOCAL OSCILLATOR
116
PLL
AFC
118
106
108
110
MICROPROCESSOR
B
MEMORY UNIT
112
100

FIG. 1

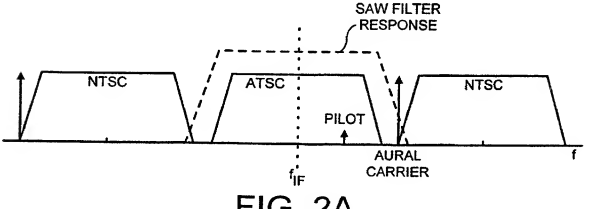
SAW FILTER RESPONSE
NTSC
ATSC
NTSC
PILOT
AURAL CARRIER
f
IF

FIG. 2A

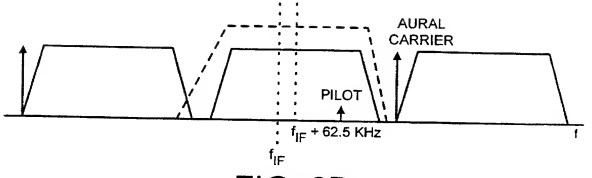
AURAL
CARRIER
PILOT
f_{IF} + 62.5 KHz
f
f_{IF}

FIG. 2B

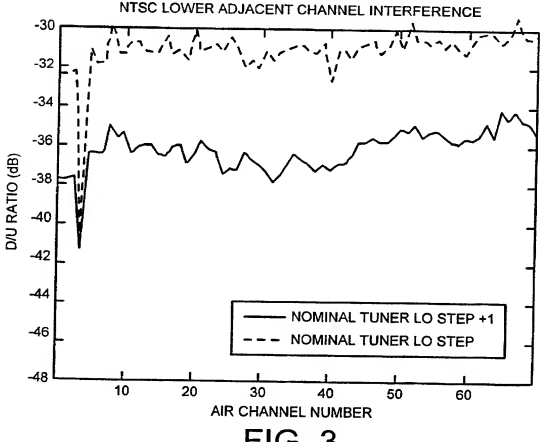
NTSC LOWER ADJACENT CHANNEL INTERFERENCE
D/U RATIO (dB)
-30
-32
-34
-36
-38
-40
-42
-44
-46
-48
10
20
30
40
50
60
AIR CHANNEL NUMBER
NOMINAL TUNER LO STEP +1
NOMINAL TUNER LO STEP

FIG. 3

EXPRESS EL902231702US

Please type a plus sign (+) inside this box → [+]

PTO/SB/01 (10-00)
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

☐ Declaration Submitted With Initial Filing **OR** ☐ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)

Attorney Docket Number	RCA 89656
First Named Inventor	Matthew Thomas Mayer
COMPLETE IF KNOWN	
Application Number	/
Filing Date	
Group Art Unit	
Examiner Name	

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

TELEVISION RECEIVER FOR DIGITAL SIGNALS WITH OFFSET TUNING PROVISIONS

the specification of which *(Title of the Invention)*

☐ is attached hereto

OR

☒ was filed on (MM/DD/YYYY) July 13, 2000 as United States Application Number or PCT International

Application Number PCT/US00/19103 and was amended on (MM/DD/YYYY) _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES	NO
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

ApplicationNumber(s)	Filing Date (MM/DD/YYYY)	
US 60/144,415	July 16, 1999	☐ Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

Please type a plus sign (+) inside this box → [+]

PTO/SB/01 (10-00)
Approved for use through 10/31/2002. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

DECLARATION — Utility or Design Patent Application

Direct all correspondence to: ☐ Customer Number or Bar Code Label [ ] OR ☐ Correspondance address below

Name	JOSEPH S. TRIPOLI
Address	THOMSON MULTIMEDIA LICENSING INC.
Address	PO Box 5312

City	**State**	**ZIP**
PRINCETON	NJ	08543-5312

Country	**Telephone**	**Fax**
USA	(609) 734 - 9404	(609) 734 - 9700

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAME OF SOLE OR FIRST INVENTOR: ☐ A petition has been filed for this unsigned inventor

Given Name	**Family Name or Surname**
MATTHEW THOMAS	MAYER

Inventor's Signature [signature] **Date** 1-3-02

Residence: City	**State**	**Country**	**Citizenship**
INDIANAPOLIS IN.	INDIANA	US	US

Mailing Address 8262 Forest Lane

City	**State**	**ZIP**	**Country**
INDIANAPOLIS	Indiana	46240	US

NAME OF SECOND INVENTOR: ☐ A petition has been filed for this unsigned inventor

Given Name	**Family Name or Surname**

Inventor's Signature		**Date**

Residence: City	**State**	**Country**	**Citizenship**

Mailing Address

Mailing Address

City	**State**	**ZIP**	**Country**

☐ **Additional Inventors are being named on the** ____ supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.